European Labor Markets and the Euro: How Much Flexibility Do We Really Need?

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Abstract

Widespread concern over real effects of EMU is consistent with new Keynesian approaches to macroeconomic fluctuations, but more difficult to reconcile with a real business cycle (RBC) paradigm. Using a model with frictions as a point of departure, I argue that nominal price rigidity in Europe is likely to increase, while real rigidities are likely to decrease, as a consequence of monetary union. One curious consequence of this logic is a new European macroeconomic regime in which monetary policy is increasingly "effective" in influencing output in the short run. Similarly, changes in the nature of real and nominal price determination may increase the volatility of the European business cycle. Empirical evidence of increasing covariation of price inflation and declining correlation of wage inflation and real wage growth within EMU countries in the last decade is consistent with this conjecture. Calls for additional labor market flexibility, given the magnitude of what is already in store for Europe, may be unwarranted.

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I. Introduction

In addition to evidence on the nature and source of regional fluctuations, European Monetary Union (EMU) will also provide economists with valuable new evidence on the monetary transmission mechanism. Given the skepticism with which macroeconomics currently regards monetary policy, current concern over real effects of EMU comes as a surprise; in a world of flexible prices, space-spanning contingent claims markets and complete information, it is difficult to see why monetary union matters at all for real integration processes already underway.[1] For example, if the real business cycle paradigm (RBC) – which emphasizes disturbances and propagation mechanisms in the nonmonetary economy and ignores nominal rigidities – is approximiately correct, the EMU exercise is nothing but a sophisticated veil. To the extent that EMU leaves fiscal policies and real behavioral incentives unchanged, the effects of a common currency are of second order at best. In short, this paper has no real reason to be written.

Yet, the liveliness of the contemporary debate – among reasonable and cool-headed economists for the most part – is suggestive of an expectation that, for whatever reasons, real effects of EMU *are* in the cards. If this is indeed the case, the underlying presumption must be that nominal disturbances to aggregate demand and the money supply in particular can influence the short-run path of output and employment, and will continue to do so after the EMU is up and running. Not wanting to make my life too easy, I have decided to write this paper from the perspective of an eclectic who is willing to entertain new-Keynesian arguments. These arguments are important, as the survival of monetary union will rest on factors outlined long ago by Mundell (1961) and McKinnon (1963). In Europe, these are perceived to originate chiefly in labor markets. From a point of departure that money and

[1] The view that short-run adjustment costs associated with EMU are small relative to long-run gains has been echoed recently by Buiter (1995).

monetary policy can influence real variables, I will discuss the macroeconomic impact of labor market rigidities on real and nominal adjustment to disturbances in Euroland. However, the most interesting aspects involve taking the discussion one step further: for a number of reasons, the arrival of EMU will itself have significant effects on the functioning of labor and product markets and the relative importance of real and nominal rigidities. These feedbacks will ultimately affect the way Europe reacts as a macroeconomic entity to demand disturbances and how its central bank views the effectiveness of monetary policy.

This paper surveys a number of issues too involved to be treated in model-theoretic detail here. I will furthermore abstain from econometric analyses for reasons which should be clear to all. There is a sense that the macroeconomic regime has changed in a way it has not in several hundred years in Europe: if the Lucas Critique has any relevance at all, it had better be here and now. I will adduce some empirical evidence however, which is suggestive of what one might expect in the future. The paper is highly speculative, but meant to be so.

The paper is organized as follows. In Section II, I first discuss the macroeconomic impact – at both regional and pan-European level – of the current structure of labor markets. Second, I survey the multifarious means by which a monetary union could affect the functioning of labor markets. This feedback takes some surprising turns, and may lead to a wholly different perception of the transmission channels of monetary policy in Europe. Section III adduces simple but compelling evidence in support of my hypotheses and Section IV concludes.

II. How will (Lack of) Labor Market Flexibility affect the Macroconomics of Euroland?

II.1 Real Rigidities and Regional Fluctuations

Robert Mundell taught us long ago that the key to a monetary union's success can be found in the synchronization of underlying economic fortunes and, barring this, the mobility

of factors of production, especially that of labor.[2] Naturally, labor mobility is costly for both natural and man-made reasons, and *im*mobility may be valued differently across cultures and traditions. Abstracting from social valuations of immobility, losses of output and welfare are involved when labor does not move to job opportunities, in a geographic, industrial or occupational sense. To the extent that regional shocks – such as an oil discovery in the North Sea or German unification – continue to occur, they will wreak macroeconomic havoc on the real evolution of output, employment and other important variables in ways which are now well understood. The lack of a flexible nominal exchange rate in a world of nominal rigidities may imply protracted adjustment to regional shocks, unless labor and other resources move to follow better economic fortunes.

Indeed, the available evidence on labor mobility in the European context is remarkably discouraging and suggests that a major component of rigidity derives from labor's unwillingness to move.[3] In addition, Europe is characterized by less immigration, lower fertility and older demographics, which further accentuates immobility. It would almost seem unfair to compare Europe with the United States, given that the gene pool of the latter constitute a selection of those of the former who had the strongest incentives to migrate. It is also worth noting that even *within* national boundaries, European labor mobility is low and not capable of erasing regional disparities, so it is unrealistic to expect much here.[4]

Yet factor mobility in a monetary union is not restricted to labor, and under conditions of constant returns one should be indifferent whether the capital migrates to labor or labor

[2] See Mundell (1961), as well as McKinnon (1963) and Kenen (1969).
[3] Indirect estimates of labor mobility for the United States by Blanchard and Katz (1992) and for Europe by Decressin and Fatas (1995) show that European regions tend to adjust to adverse employment shocks via changes in labor force participation as opposed to residence. For more detailed summaries of the evidence see Eichengreen (1993) and Gros and Hefeker (1998) as well as Obstfeld and Peri (1998).
[4] See Gros and Hefeker (1998) for an overview.

migrates to capital.[5] In theory, EMU will liberate capital mobility as exchange rate risk vanishes, and in fact intra-European capital mobility has surged in recent years. This is documented in Table 1, which shows the evolution of intra-EU foreign direct investment (FDI) flows since the 1980. The persistent boom in European equities can be seen in part as a reaction to the increased mobility now afforded to capital by a common currency and increasingly unified asset markets, combined with efficiencies offered by unified market for goods and services. Whether mobile capital can smooth out fluctuations is not well-understood; it stands to reason, however, that capital should move to places where labor is in excess supply.

Product market integration is potentially more important than either form of factor mobility. Heckscher-Ohlin trade theory under incomplete specialization implies that harmonized product prices in traded output produced with the same technology leads to wage convergence (factor price equalization theorem). Consequently the need for factor mobility is eliminated and the market spreads shocks automatically across the currency area. Here evidence by von Hagen and Neumann (1994), Fatas (1997), Frankel and Rose (1996), Bayoumi and Eichengreen (1993, 1996) and others seems to point to increasing product market integration over time, although this literature has tended to emphasize quantities more than prices.

<Table 1: Intra-EU Foreign Direct Investment Flows, 1985-1994 (% of GDP)>

II.2 Nominal Frictions, Real Rigidities and pan-European Macroeconomic Fluctuations

The next point of discussion is the role of nominal frictions in the European context. What could the sources of non-neutralities of money in a future EMU be? Arguing from the status

[5] It is remarkable that the optimal currency literature has largely ignored the role of capital mobility – meaning long run mobility of the means of production – despite Mundell's own explicit reference to it in his seminal article. For examples, see discussions in Bofinger (1994), Bayoumi and Eichengreen (1996), Wyplosz (1997), or Gros and Hefeker (1998) .

quo, the common perception is that nominal rigidities play a subordinate role in European business cycles. The standard assumption is that the large role of centralized collective bargaining, the use of indexation, and a high degree of openness all made Europe more likely to translate demand disturbances rapidly into inflation than the United States, Canada, or Japan. A thorough if somewhat dated discussion of these issues can be found in the work of the late Michael Bruno and Jeffrey Sachs,[6] who distinguished between US and continental European labor markets by their reaction to nominal demand and supply shocks. For them, the structure of labor markets – meaning to a large extent institutions of wage determination – was a key determinant of adjustment to macroeconomic and especially supply side disturbances.

As this paper's role at a conference on the monetary transmission mechanism suggests, the functioning of the labor market will be central to understanding the effects of EMU.[7] Mainstream macroeconomics predicts real effects of money and nominal demand fluctuations when impediments prevent the clearing of product and especially labor markets. While the origin of these impediments are still poorly understood, it is also clear that the role of rigidities in nominal and real spheres are highly complementary for any neoclassical or "new Keynesisan" account of macroeconomic fluctuations (Blanchard (1990), Ball and Romer (1990), Romer (1996), Jeanne (1998)). This means that it is not sufficient for nominal rigidities (such as menu costs) to exist, but they must also exist alongside real rigidities. In one widely-cited mechanism, *coordination failures* prevent agents from moving the economy to a better equilibrium.

This complementarity lends intuition to Milton Friedman’s (1953) argument for floating exchange rates. In a famous analogy, Friedman compared the gains from flexible rates to those

[6] See Bruno and Sachs (1985), Sachs (1979, 1983), but also Branson and Rotemberg (1980).

from setting all clocks back one hour in the fall and forward in the spring: it is more efficient to change the nominal time standard (the nominal exchange rate) than it is to require millions of individuals to adjust their daily time schedules (nominal domestic prices) to the annual solar cycle (changing demand and supply conditions).[8] Blanchard (1990:810ff.) and especially Romer (1996:283) make the reasoning more explicit: individuals do not change their nominal schedules in the absence of daylight savings time because of the real costs they incur, given that all others do not change their behavior.

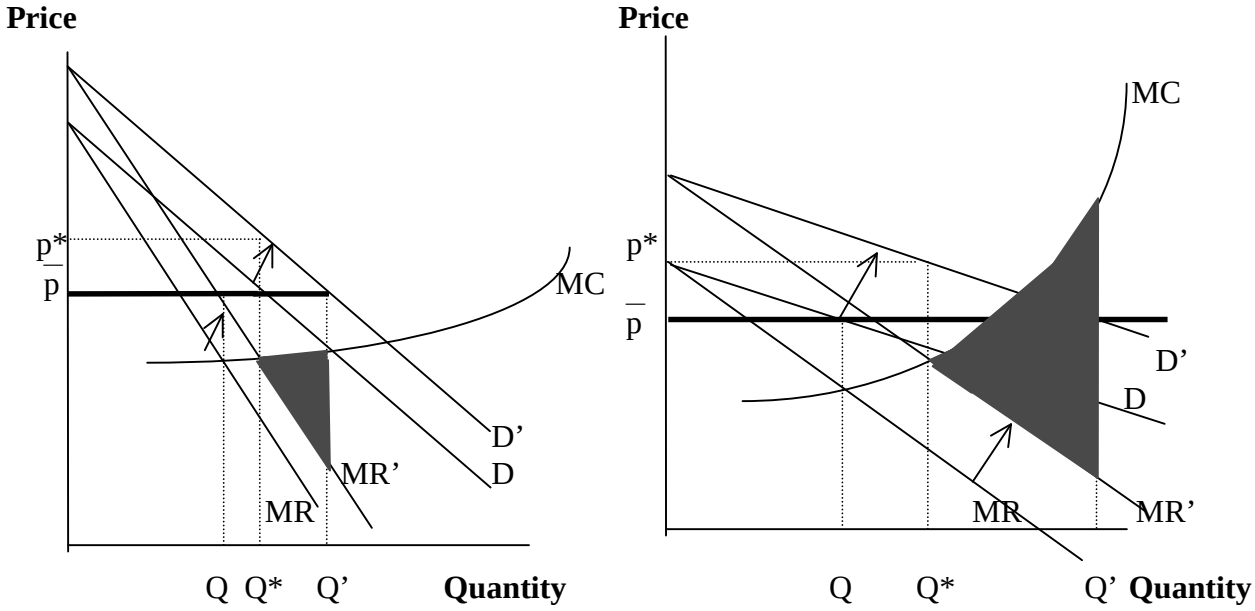
We are dealing with firms which set prices. The extent of real rigidities for a given price change can be thought of as the resource cost to firms of not moving to optimal pricing *in the absence of nominal frictions*. In the two panels of Figure 1, this is given by the shaded areas, which are approximately triangles with base equal to the output difference between passive quantity adjustment at rigid price $\bar{p}$ given by Q', and the profit-maximizing quantity given by Q*, and height equal to the gap between marginal cost and marginal revenue at output level Q'. The latter depends on various factors such as the behavior of the marginal product of labor, marginal capacity costs, and the elasticity of labor supply. In the first panel, the costs of *not* changing price from $\bar{p}$ to p* are relatively small, since the desired quantity change is modest and marginal costs are flat. In contrast, the firm depicted in the second panel is under considerable cost pressure to change prices, as can be seen by the vertical difference between marginal revenue and price for the last units produced. Passive quantity adjustment implies a large departure from unconstrained optimal production Q*, while sharply rising marginal

[7] Among others, Romer (1996) has stressed the labor market as a primary source of real rigidities in the macroeconomy, as complementary to nominal rigidities.

[8] "The argument for flexible exchange rates is, strange to say, very nearly identical with the argument for daylight savings time. Isn't it absurd to change the clock in summer when exactly the same result could be achieved by having each individual change his habits? All that is required is that everyone decide to come to his office an hour earlier, have lunch an hour earlier, etc. But obviously it is much simpler to change the clock that guides all than to have each individual separately change his pattern of reaction to the clock, *even though all want to do so*." (Friedman (1953), p.173, my emphasis).

costs means that these units are being produced at a large loss.[9] For a given costly nominal price adjustment, the firm in panel a) is likely to maintain rigid nominal pricing, while the firm in panel b) will adjust its prices.

Figure 1. Complementarity of Real and Nominal Rigidities for a given price change



a) nominal rigidities more important **b) nominal rigidities less important**

It is worth stressing that a central property of the macroeconomics of real rigidities is that individual firms have little incentives to change prices given that others are not doing so. This strategic complementarity implies that what appear at the firm level to be second order issues can have first-order macroeconomic effects.

Money wage rigidity can also be associated with fluctuations. While an important element in the early intellectual development of Keynesian macroeconomics, nominal *wage* rigidity is generally not borne out at the micro level (Bils 1985) nor is it particularly supported

[9] In fact, the firm in panel b) is more likely to ration output, producing only to the point at which price equals marginal cost, and thereby violating the assumption of completely passive (i.e. demand-determined) adjustment of production to demand. In any case the point goes through that incentives to change prices in this case are large.

by aggregate evidence on wage and price dynamics (see references in Blanchard 1990); Jeanne (1998) has recently shown that nominal price rigidity, combined with some degree of real wage rigidity, is sufficient to generate persistent cycles that resemble US business cycles.[10]

II.3. Summary

The discussion above can lead to rather sobering conclusions about the future of EMU. First, the conventional wisdom of extreme rigidity in labor markets, which now has the OECD seal of approval (OECD 1994) and is accepted nowadays by everyone except the labor unions and perhaps a few surviving extremists in the German finance ministry, should render the EMU a Mundellian nightmare. It won't be necessary, according to this logic, for another German reunification to occur to generate real problems. All we need is some overheating in Ireland, Portugal, or Finland, and the whole EMU project will collapse as the other regions slump without any equilibrium mechanism.

An equally pessimistic message emerges on the monetary transmission mechanism when considered under these circumstances, in which a rapid pass through into inflation is taken for granted by market participants. Recent reviews by Buti and Sapir (1998) and Dohse and Krieger-Boden (1998) give rather somber pictures of the prospects, and Dornbusch et al (1998) raise questions about the asymmetric impact of monetary policy on the participating EMU countries. Moreover, fiscal policy is hamstrung by the Maastricht treaty and the Pact for Stability and Employment and potential exists for beggar-thy-neighbor effects as countries jockey to better their macroeconomic circumstances. This "Flassbeck-Lafontaine-Hypothesis" sees purposeful competitive deflation just around the corner, as countries unable to devalue are forced to regain competitiveness by more painful means. In this view, governments, robbed of their power to generate instant nominal devaluations will do what Britain did in the first half

[10] For evidence on the rigidity of prices in the United States see Carleton (1986); summaries of empirical

of the 1920s. Eichengreen (1998) has already speculated on the "dissolution" of the European Monetary Union before it begins.

Given this doomsday scenario, critical economists are compelled to ask the question: Are rigidities in Europe set in stone? Is it reasonable to assume that the Euro will leave labor markets and their institutions intact and if not, which ones are implicated? What will be the consequences of these changes? What follows is clearly highly speculative, but worth thinking about all the same. I will divide my discussion into three areas: 1) nominal rigidities 2) real rigidities, holding institutions constant, and 3) changing institutions.

III. Will the Euro affect Labor Market Flexibility?

III.1. Nominal price rigidity should increase

There are a number of reasons to expect nominal rigidities to increase in Euroland, especially that of nominal prices. First, the introduction of a common currency will effectively convert a Europe of many small open economies into a behemoth with an import-export exposure of 10% of GDP, roughly as closed as the United States and Japan. This is a regime change of striking character. As a consequence, a large share of industry will be moved into the "home goods" sector, and will no longer be exposed to vagaries of nominal exchange rate and international demand fluctuations. For small, open economies with output more likely to be concentrated in the value-added chain, exchange rate disturbances are reflected rapidly in both input and output prices; a monetary union in Euroland removes this aspect, as inputs become increasingly nontraded goods invoiced in Euros. Devaluation-induced expenditure switching is no longer possible on a grand scale.[11] Factors favoring nominal rigidities – i.e. customer relationships, search costs, etc. – will become relatively more important than costs

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evidence are available in Blanchard (1990) and Romer (1996).

associated with cross-border transactions.[12] Cost pressures will increasingly be restricted to domestic (Euroland) labor markets, marginalizing the importance of exchange rate changes for pricing decisions.[13] Figure 2 illustrates how the reaction of local currency costs to a devaluation are decisive in determining incentives to adjust prices; prices are more likely to be marked up in the first panel than in the second.

A second effect is more subtle (and possibly less relevant). A common currency area is generally assumed to *increase* competition, as improved price transparency opens up national markets to intra-EMU, cross-border rivals. At the same time, however, monetary union in Europe necessarily implies a significant *decrease* in the overall relevance of the external market for the representative producer . Assuming that foreign trade is perfectly competitive and priced off the exchange rate according to the law of one price, the representative exporting firm pre-EMU, ironically, may face an enlarged domestic market with *more* pricing power on balance, to the extent that the market using Euros increases relative to that using foreign currencies. To the extent that "inwardization" increases monopolistic power in price setting, it will increase incentives not to adjust prices in their own currency, for reasons stressed by Akerlof and Yellen (1985), Mankiw (1985) and Romer (1996). Increased exposure to the sheltered domestic market will mean greater incentives to price to market and to set nominal prices in advance for longer periods, as customer relations become more important and the net benefits of charging stable nominal prices increase (Okun 1982).

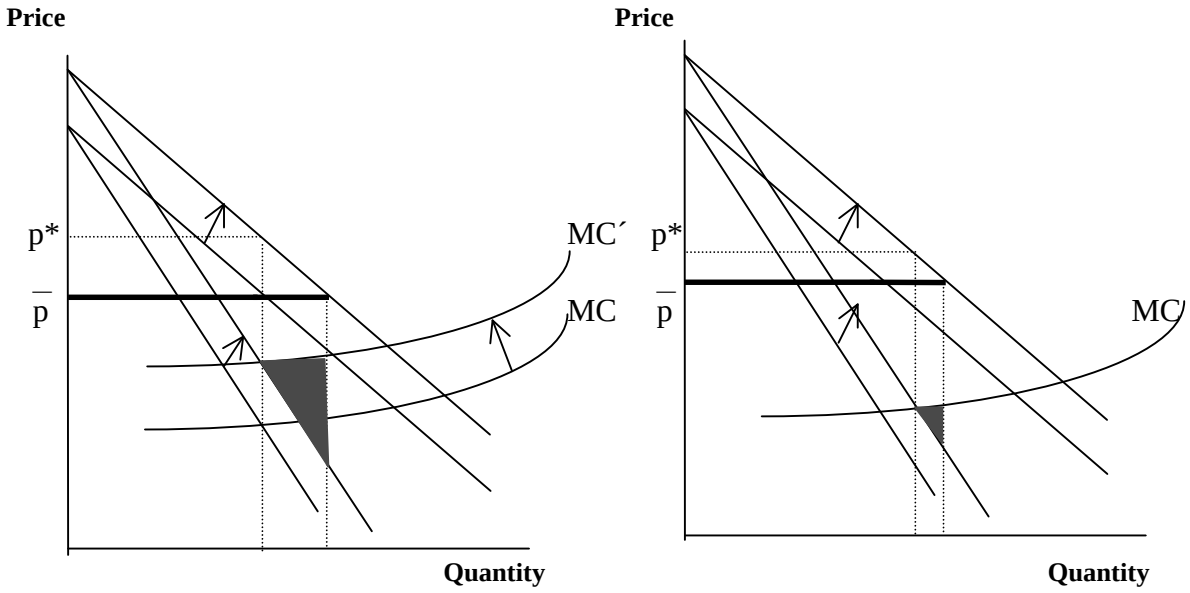
The third effect and potentially most important effect flows from the credibility that comes from having a central bank which can "stand above" (i.e. ignore) economic conditions

[11] This argument can also be found in McKinnon (1963), who stresses the role of nontraded goods in the reaction to devaluations.

[12] The failure of firms selling *into* the United States fully to pass through exchange rate fluctuations is well-documented (see Knetter (1989), Feenstra (1995), Dornbusch (1987) and Dornbusch (1996)) and could be seen as an indication of what Euroland can expect.

in individual countries and be free of political pressure. To this extent if the ECB is really the most independent central bank in the world, agents will be more prone to expect low inflation and will not attribute deviations to policy changes. This important source of inertia should be distinguished from the usual wage-price mechanism (e.g. Blanchard 1990); rather it has to do with the anchoring of inflationary expectations and the effect this will have on the willingness to negotiate contracts in nominal terms.

Figure 2. The cost of passive quantity adjustment in response to an exchange rate depreciation



a) an open economy b) a closed economy

To give some sense on the evolution of rigidities, I present some simple statistics for data on comparable price and wage time series from EU member countries.[14] Table 2 displays

[13] One exception could be energy prices, which continue to be denominated in dollars. As Europe is the largest customer of the oil exporting Middle East and Russia it may come to pass that oil prices are denominated in Euros. The relevant effect of course, is that oil prices in Euros will tend to become more stable over time.

[14] The empirical evidence I present in this paper is rather modest, as it seems foolish to place much weight on estimates of structures in place before monetary union. On the other hand many investigators have looked at the temporal evolution of cross correlation of price and quantity variables. Von Hagen and Neumann (1994) examined the temporal evolution of the contemporaneous correlation of innovations to real exchange rates among West German states and candidates for European monetary union on the other. Bayoumi/Eichengreen (1996) estimate SVARs and examine the estimated residuals over the German unification period; they criticize looking at prices to the extent that they may reflect extraneous information. Frankel and Rose (1996) show that as trade links are strengthened, correlation of income increases across the EU; they conclude that *ex-post* satisfaction of

average unweighted correlations of bilateral inflation rates (first difference in the logarithms) for a number of groupings of countries in addition to the Euro-11 since 1961. For comparison, I present data for eight regions of the United States for a similar time period. Clearly, an increase in price convergence has taken place across the board, not only in the smaller "core" groupings. The eigenvalues of the moment matrix indicates the extent to which inflation in one country can be expressed as a linear combination in others. Table 3 documents that to a large extent my conclusions hold when looking at a much smaller time interval and when correcting for exchange rate changes.

<Table 2 here >

<Table 3 here >

It has been argued, by Calmfors (1998a) and others, that monetary union could result in increasing nominal money wage rigidity. Presumably this would arise as a result of the low level of inflation and resistence to nominal wage reductions. In addition, the alignment of traded goods prices should impose factor price convergence, as long as complete specialization does not occur first, although this can only be a statement about labor of a given quality. At the same time, Calmfors (1998a) claims that increasingly variable macroeconomic conditions might lead to shorter nominal contract periods and greater nominal wage flexibilty.

Nominal wage behavior in Europe over the past thirty years lends support to my contention that nominal wage are less likely to be rigid than prices. Table 4 and 5 clearly show a determination in the strong positive correlation of real wage growth present in the 1960s and 1970s. To the extent that increasing "entropy" in the behavior of nominal wage movements is reflected by decreasing cross-country correlation, this supports the assertion that nominal

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the criteria is more likely since a common currency strengthens trade integration and increases the covariation of shocks. For details on the data used, the reader is referred to the Appendix.

wage flexibility is increasing, not decreasing over time. The largest eigenvalue of the moment matrix for first differences in nominal wages, compared with that of nominal prices, is larger and the decline in the eigenvalues are smaller, suggesting that nominal wages in this context do not seem to earn the title "rigid".

<Table 4 here >

Not only are nominal wages less correlated across European countries than US regions but their levels have exhibited divergence in the past decade. Table 5 displays US BLS data on hourly compensation in the European Union and computes coefficients of variation for the groupings CORE (Belgium, Luxembourg, France, Germany and Austria); CORE+Denmark+France+Italy; The EURO-11 (CORE plus Ireland, Finland, Spain, Portugal, France and Italy). For each grouping Germany was retained and dropped to examine the influence of this country, especially in light of German unification. In all cases except the CORE less Germany (the Benelux countries plus Austria), the cross-country variability of nominal wages *increased* over the ten year period.

<Table 5 here >

<Table 6 here >

III.2. Real rigidities should decrease given current institutions

It is interesting that there are so many who believe that real rigidities in Europe threaten the success of monetary union, and I am sure that I was invited for my perceived views on real rigidities in European labor markets. Indeed a number of arguments can be found to buttress the claim that inflexibility in the labor market will spell the death of EMU. Yet how robust are these arguments to the Lucas Critique, i.e. the introduction of the Euro? In my view, the more important and subtle effect of EMU has largely escaped scrutiny: How will a common

currency affect the functioning of labor markets? Could the vaunted lack of labor market flexibility in continental Europe be affected by the introduction of a common currency? If so, how?

Because the quantification of real rigidities is difficult and undoubtedly subject to regime changes (Calmfors 1998a) it seemed unwise to estimated measures of nominal and real wage rigidity; on the other hand it is reasonable to conclude that for the most part the two pressure points on which all real rigidities rest are 1) collective bargaining and unions and 2) the social safety net and especially unemployment benefits. My discussion below will concentrate primarily on these, as other rigidities flow from these two.

The elasticity of labor demand will increase

The first Euro-assault on real rigidities is the weakening of union power in wage determination. While unions are already in retreat in much of the OECD (OECD 1996), in Europe this decline is largely restricted to Britain; membership losses in France and Italy belie an ever-strong influence on central wage setting institutions; in Germany, membership has declined primarily in the East, where it was artificially high to begin with. Yet the brave new world of Euroland portends ill for continental collective bargaining, which has always been a national institution with national idiosyncracies. A simple textbook argument – namely, the Marshall-Hicks rule of labor demand – predict that the melding of European nations into a currency union will severely attenuate unions' ability to monopolize the supply of labor by increasing the demand elasticity they face.[15]

Three of the four elements of the Marshall-Hicks rule will be operative. First, labor unions derive their attractiveness from their ability to tap into quasi-rents that their employers

[15] The Marshall-Hicks-rule states that the elasticity of demand for labor is higher, the higher the elasticity of demand for output produced with that labor, the higher the elasticity of substitution between labor and other

can earn in the market. In a globalizing Europe, product market competition among companies operating with quasi-rents will increase dramatically, which translates into an increase in the elasticity of product demand and the elasticity of the derived demand for labor.[16] Second, the acceleration of intra-European corporate mergers and takeovers opens up the possibility of easy substitution of cheaper labor as well as capital for more expensive labor within the Euroland area. This dilutes monopoly power and bargaining strength of national unions. Third, for any given national labor market, the rest of Euroland is large (and possibly getting larger), meaning that the supply elasticities of competing factors is likely to be high.

How will European labor unions cope with these powerful winds of change? Already hamstrung by fragmentation along industrial, regional, or religious lines, they will face language and national cultures as further barriers to their effectiveness. Despite considerable rhetoric, recent searches of labor union literature (including the Internet) have yielded little concrete evidence of an effective Pan-European labor movement. While a similar argument applies to employer associations, the growing transnationality of capital puts labor at a clear bargaining disadvantage – a forced decentralization in the sense of Calmfors/Driffill (1986). Recent speculation that Euroland national unions might coordinate bargaining strategies must be discounted sharply in light of the lack of comparable union structures across countries, which is essential to purposeful pattern bargaining. To me at least, it seems highly implausible that Europeans will accept wage leadership of German engineering and public sector workers after having finally shaken themselves from the yoke of Teutonic monetary policy!

Strategic interaction of unions with the central bank will change

inputs, the lower the elasticity of supply for those competing inputs, and the greater the cost share of labor in production. See Hamermesh (1993).

[16] For evidence on how product market competition has affected labor unions and labor markets in the US in general, see Duca (1998).

The argument that labor market rigidities might be endogenous has been made by a number of analysts (Danthine and Hunt 1994, Berthold and Fehn 1997, Dohse and Krieger-Boden 1998 among others). While I take the position that competition will impose decentralization and deregulation of EMU labor markets, a number of analyses emphasize changing strategic interactions between central banks, unions and governments and the effect these can have on aggregate outcomes. In particular the incentives for unions to internalize the effects of their wage demands on the macroeconomy stands at the center of this discussion.[17] An important strand of the literature which has emerged in the run-up to EMU takes Calmfors and Driffill's (1986) contribution as a starting point, which relates the centralization of collective bargaining to the degree to which unions internalize the effect of collective bargaining on the macroeconomy. Early on the risks of simply extending this analysis to the EMU context were made clear by Danthine and Hunt (1994). They showed that product market integration will play an important role in flattening out the "hump" therefore rendering centralization of collective bargaining less relevant. Another strand has been explored by Cuikerman and Lippi (1998, 1999) who look at strategic interactions of the centralization of nominal wage setting and central bank independence.

While these analyses are intellectually stimulating, I am convinced that the most pressing effects of monetary union derive from the fact that existing market imperfections and distortions will be subjected to forces of competition; these effects could easily swamp Barro-Gordon and Calmfors-Driffill and issues of time-consistency, reputation and coordination. I would therefore go even farther than Danthine and Hunt (1994) and argue that structural change implied for labor and product markets needs to be studied carefully before venturing guesses on strategies policymakers could play against each other in the future. It is of course

[17] Calmfors (1998a, 1998b), Grüner and Hefeker (1998), Lippi and Cuikerman (1998, 1999), Soskice and Iversen (1999).

the Lucas critique again: the elasticity of labor demand will change, the objectives of labor unions will change, their constraint sets will change; the analyses cited above generally assume complete product market integration and ignore capital as a competing factor of production. Local national unions which insist on aggressive wage settlements will be faced with higher local unemployment. Only if the social safety net accomodates the higher unemployment are unions likely to ignore these factors, and given the hard budget constraint of the monetary union, they will find it increasingly difficult to do so.

III.3. The Euro and labor market institutions

An equally interesting hypothesis is that European jurisdictions will adapt and possibly reform labor market regulation in light of the increasing pressures brought about by EMU as well as globalization and technological innovation. In this view, increased competition among member EU states as well as among regions within EU states will lead to a Nash equilibrium in which each member state disregards the effects its behavior has on the others. This type of competition might emerge directly, in which some initiate direct labor market reforms in the hope of "beating the competition" and reap short to medium-term gains; the recent success stories of the Netherlands and Denmark might be viewed in this light. Another channel is increased tax competition – especially, but not only corporate taxation – to enhance the attractiveness of investment in local economies (*Standortwettbewerb* in the local jargon), as Ireland has done aggressively in recent years. This tax competition puts strain on national member country finances and may force spending cuts and structural reforms. The experience of US states in this regard indicate that this mechanism can be powerful indeed. Bean (1998) has discussed this aspect.[18]

[18] Arguing from a Barro-Gordon perspective, Calmfors (1998c) has conjectured that incentives to reform inside the EMU are greater than outside, since countries with control over monetary policy are likely to view labor

At the same time, it seems unlikely that the EU Commission and Parliament will sit idly and watch this "race to the bottom". Already minimum capital taxation has been all but agreed to, while the probability of of increased international (intra-European) competition along the social dimension is severely hampered by the Social Charter, which was ratified at Strasbourg Summit in 1989 by all EU governments except the UK.[19] The recent about-face on fast-track membership of the new market economies of Central and Eastern Europe may reflect a fear that unbridled competition in both regulatory and tax dimensions might be triggered by early admission these countries. Yet the lack of consensus for a federal European fiscal policy means that little substantive support for harmonization will come from the top.

III.4. Summary

What are the macroeconomic implications of increasing nominal rigidity and real flexibility, *ceteris paribus*? The empirical evidence, which is meant to be suggestive, support the contention that nominal price rigidity has increased, and that inflation convergence has been associated with product market integration and exchange rate stability. Nominal wages in contrast are highly correlated only in the core, and this applies a fortiori to real wages and real exchange rates as well. My remarks suggest that the Euro will affect labor market flexibility in the direction of *more efficiency*. Whether this increase in efficiency will lead to overall welfare gains is impossible to say without more information on preferences; some analyses, such as Agell (1998), assert that labor market rigidities may reflect welfare-improving policies in the light of other market imperfections. Burda (1995) has presented a related rationale for union wage compression.

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market reform and monetary policy as substitutes for reducing unemployment, while inside EMU the latter vanishes. Reforming labor markets provides one means of insuring against idiosyncratic shocks. This remarkable argument would be strengthened by hard fiscal pressures generated by unemployment, as well as the reorientation of national objective functions when inflation can no longer be influenced by national policies. Similarly, Hefeker (1998) assumes unions which choose both the nominal wage and the degree of flexibility.

Capital will gain, unions will be on the defensive, wage setting should moderate unless pan-European efforts arise to coordinate. On the collective bargaining front, managing this change will require Herculean efforts on the part of national labor movements. In this vein one could expect a restructuring of unions in France, Spain and Italy (and possibly the UK) towards centralized industrial unions in order to facilitate cross border cooperation; Dohse and Krieger-Boden (1998) describe the emergence of "European Works Councils" in large enterprises. Yet the reality of labor relations in these countries as well as the divergence of the interests of labor at the national level portend less dramatic changes (Streeck 1998). While the possibility of pattern bargaining by large industrial unions – as in Austria, Germany, or Sweden – is frequently discussed, it is difficult to see how it could lead to truly coordinated outcomes without a strong central organization as is the case in these countries. Because I see pan-European coordination coming in a decade's time at the earliest, a more modest goal for organized labor would simply be to get control over the process. The example of Eastern Germany can be seen as a lesson on how not to do it.

In increasing nominal wage flexibility combined with nominal price rigidity is likely to lead to increased real wage flexibility. Casual evidence I have assembled in Tables 7 and 8 clearly show real wage behavior in EU members has become increasingly uncorrelated over time, and that this tendency increases with the size of the group considered. This can be contrasted to evidence from the US, which shows a remarkably high correlation given the size of the regions considered.

<Table 7 here >

<Table 8 here >

[19] For a discussion of these issues see Belke (1996).

The evidence on the eigenvalues suggests that there is enough "insurance potential" in many respects to reduce Europe-wide risks, but it is not showing up in wage growth rates. The dramatic deterioration of real wage correlations is evidence, to my mind at least, that there is potential for flexibility, at least between the "core" and the rest of the Euro-11. This flexibility may actually be the key to my assertion of a "forced decentralization" which may not have been possible, had been a two-track solution to the monetary union question been implemented.

The macroeconomic implications of increasing nominal rigidity and declining real rigidity, *ceteris paribus*, are somewhat surprising. Following old conventional wisdom (Sachs 1979, 1983, Bruno and Sachs 1985), the United States was characterized by nominal rigidity but real wage flexibility; the nations of Europe in contrast had real rigidities but not nominal ones, which led to accentuated responsiveness of nominal wages to aggregate demand developments, especially anticipated ones, and to an attenuation of policymakers' ability to use monetary policy even to the limited extent now allowed in mainstream macroeconomics. The implications of my analysis is that Europe is likely to develop a more pronounced cycle of its own, but more important, will develop an own response to its own monetary policy. This is the conclusion reached by more recent analyses such as Jeanne's (1998).

IV. Concluding Remarks

In addition to its historic dimensions, European Monetary Union (EMU) will shed new light on a number of old, bothersome questions. Naturally, it will help us understand better how monetary unions function. In the first instance, however, it will teach economists and policymakers the relevance of the new Keynesian approach to understanding aggregate fluctuations, for which there is precious little evidence in the data. It will also help us decide

whether nominal price or wage rigidities are more relevant for explaining the real effects of aggregate demand fluctuations and thus the transmission mechanism itself.

The convergence of exchange rate and especially price dynamics suggests that the preconditions for nominal price rigidities have become more favorable. At the same time, trends in money and especially real wages seem to support the point that real rigidities are becoming less important. Simple reasoning suggests that economic conditions and institutions are increasingly unfavorable for "business as usual" in the European union. The breakaway behavior of the Netherlands, Denmark and possibly Ireland and Portugal support the hypothesis that EMU is a Trojan horse of decentralization – not only *de facto*, but more importantly for structural reasons related to integration of product and capital markets.

As many have recognized, the functioning of labor markets is central to the macroeconomic future of Euroland, but the mechanisms are remarkably subtle. The most important of my messages can be summarized as follows. First, the introduction of common currency, price transparency and internal trade integration --- will lead to a "inwardization" of the European continent with the implication that internal and external nominal shocks will have less impact on nominal wage and price setting, and show up more strongly in output variation. Second, the standard analysis suggests that this will be related to the extent the underlying real economy allows output fluctuations to occur. In the past continental European countries were known for their "real rigidities" and appeared to respond quickly to changes in demand.

Yet my prediction that the EMU amounts to a "forced decentralization program" which will subject these rigidities to increasing pressure is accompanied by an optimism that a reduction of these rigidities will follow. Most important of the forces are increasing capital mobility, trade integration, and competition, which will force wages for labor of given quality to converge (factor price equalization) as well as to react more flexibly to changing local real

conditions. Labor mobility, while a central point of discussion, is a side show which isn't as relevant in the short run for the US as its made up to be.[20] As more continental European countries pare back safety nets, it will become increasingly difficult for real wage determination to stay out in front of nominal developments. This flexibility will also be evident in downturns, a fact which helped the US recover high employment levels over the last 15 years. Using arguments detailed in the paper, this will facilitate a more potent monetary policy. My prediction is that, unless an improbable miracle in pan-European collective bargaining occurs, labor markets will become *more* and not less flexible in the future. Calls for additional flexibility may be the economic equivalent of whipping a dead horse.

As if it were not controversial enough to suggest that the Euro will be the Trojan horse which liberalized labor markets, it is also likely that the macroeconomics of Europe will undergo a significant qualitative change over the next decade and thus to foster in a new regime for fiscal and monetary policy. Monetary policy should gain a new potency, as Europe begins to look more like the US and Japan and less like Germany and France. A new role for monetary policy should emerge, although the usual caveat remains that the effectiveness of monetary policy is largely an artifact of its not being used in a predictable way to inflate the economy (Taylor 1980). Therefore my paper should not be construed as endorsing a Lafontaine "internal market strategy", but rather a warning that the temptation to employ such a strategy will increase in future years.

Of course, my analysis is predicated on the view that nominal rigidities, especially price rigidities, are important in the evolution of a macreconomy in the short run. If I turn out to be wrong and have to eat my hat, this fact will nevertheless have been useful information for our

[20] Willem Buiter (1995) has made this point, as have others. If one looks carefully at Blanchard/Katz (1992) it implies adjustments to adverse shocks which are long and drawn out, even if they do occur via migration.

profession as well as policymakers. If I am right, European Monetary Union will have delivered the ultimate bonus in real efficiency gains for the unemployment-riddled labor markets of the Continent.

Table 1.

Intra-EU Foreign Direct Investment Flows, 1985-1994 (% of GDP)

Country	Direct Investment Inflows from EU countries		Balance of Direct Investment to other EU countries	
	1985-1989	1990-1994	1985-1989	1990-1994
Ireland	(0.32)	(0.13)	n.a.	n.a.
Portugal	1.01	1.72	0.96	1.38
Spain	1.02	1.54	0.81	1.24
Sweden	0.26	1.11	-1.25	-0.69
Denmark	0.39	1.05	-0.27	-0.05
Netherlands	0.91	1.29	-0.26	-1.34
Belgium/Luxembourg	1.64	3.05	0.36	0.73
United Kingdom	0.84	0.69	-0.01	-0.17
Austria	0.24	0.35	0.07	-0.08
Italy	0.24	0.19	-0.03	-0.17
Greece	0.21	0.53	n.a.	n.a.
Finland	0.23	0.47	-0.73	-0.75
Germany	0.17	0.11	-0.28	-0.62
France	0.42	0.67	-0.19	-0.26

Source: Dohse and Krieger-Boden (1998). Numbers in parantheses are described as highly unreliable.

Table 2.
Synchronization of Price Inflation in Europe and USA

	Average Correlation Coefficient in Group			**Smallest and Largest Moment Matrix Eigenvalues (1961-79) and (1980-96)**		
	Total Sample	1961-79	1980-96	1961-79	1980-96	Percentage change
Core Europe (B,NL,D,A)	0.76 (0.08)	0.80 (0.06)	0.82 (0.09)	0.000982 0.20730708	0.00058991 0.09279977	-39.9% -55.2%
Core Europe + F, DK, IT	0.74 (0.11)	0.71 (0.13)	0.81 (0.12)	0.00087373 0.56002528	0.00016424 0.36342533	-81.2% -35.1%
Euro-11 lite*	0.73 (0.14)	0.73 (0.14)	0.80 (0.15)	0.00065278 0.98344694	3.88×10^{-5} 0.6017436	-94.1% -38.8%
Euro-11 lite* + DK, S, UK	0.71 (0.13)	0.70 (0.15)	0.78 (0.14)	0.0003172 1.3359869	3.69×10^{-5} 0.8110709	-88.4% -39.3%
Memo: USA 8 Regions, 1978-1992, GSP deflator	0.95 (0.03)			1.48×10^{-5} 0.3757289		–

Note: Inflation is measured as first difference in the logarithm of the relevant price index
Source: US: Bureau of Economic Analysis (REIS), International Monetary Statistics.
*less Luxembourg. Portugal

Table 3.
Inflation Correlations, in National Currency and DM Terms

	Average Correlation Coefficient in Group					
	Annual OECD Inflation Rate			Annual OECD Inflation Rate in DM-Terms using BLS exchange rates		
	Total Sample	1976-86	1987-96	Total Sample	1976-86	1987-96
Core Europe (B,NL,L,D,A)	0.82 (0.10)	0.81 (0.08)	0.77 (0.12)	0.56 (0.27)	0.52 (0.31)	0.70 (0.17)
Core Europe + F, DK, IT	0.80 (0.11)	0.79 (0.12)	0.33 (0.50)	0.45 (0.23)	0.45 (0.25)	0.38 (0.41)
Euro-11	0.79 (0.13)	0.67 (0.26)	0.48 (0.37)	0.44 (0.21)	0.48 (0.24)	0.37 (0.40)
Euro-11 + DK, S, UK	0.78 (0.12)	0.67 (0.24)	0.45 (0.41)	0.49 (0.21)	0.54 (0.22)	0.38 (0.42)

Source: OECD.
Note: OECD inflation corrected using BLS exchange rates

Table 4.
Synchronization of Nominal Wage Growth In Europe and USA

	Average Correlation Coefficient in Group			**Smallest and Largest Moment Matrix Eigenvalues (1961-79) and (1980-96)**		
	Total Sample	1961-79	1980-96	1961-79	1980-96	Percentage change
Core Europe (B,NL,D,A)	0.85 (0.06)	0.76 (0.17)	0.46 (0.11)	0.0021457 0.6880744	0.0012385 0.1304939	-42.3% -81.0%
Core Europe + F, DK, IT	0.72 (0.15)	0.52 (0.32)	0.48 (0.18)	0.0014924 1.4927945	0.0006593 0.4510757	-55.8% -69.8%
Euro-11 lite*	0.71 (0.15)	0.46 (0.35)	0.55 (0.22)	0.0005582 2.3874426	0.0002569 0.7598296	-54.0% -68.2%
Euro-11 lite* + DK, S, UK	0.66 (0.18)	0.48 (0.31)	0.50 (0.26)	0.0001797 2.9646467	6.07×10^{-5} 0.9811197	-66.2% -66.9%
Memo: USA 8 Regions, 1978-1992, annual comp.	0.92 (0.06)			2.01×10^{-5} 0.448761		–
Memo: USA 8 Regions, 1978-1992, wages/salaries	0.90 (0.08)			1.65×10^{-5} 0.4253274		–

Note: Nominal wage growth is measured as first difference in the logarithm of the wage index.
Source: US: Bureau of Economic Analysis (REIS), International Monetary Statistics.
*less Luxembourg. Portugal

Table 5.
Nominal Wages in Manufacturing in the EU, 1986 and 1996

Money Wages in Europe in Dollars (nominal hourly compensation)			*Unweighted Coefficients of Variation of Nominal Wages*		
Land	***1986***	***1996***	***Grouping***	***1986***	***1996***
Luxembourg	10.86	22.55	**CORE**	0.095	0.143
Belgium	12.43	25.89	**(A,B,D,L,NL)**		
Germany	13.43	31.87			
Netherlands	12.22	23.14	**CORE less D**	0.077	0.064
Austria	10.73	24.95			
France	10.28	21.19			
Denmark	11.07	24.24	**CORE +DK,I,F**	0.098	0.173
Italy	10.47	17.48			
Finland	10.71	24.95			
Ireland	8.02	13.85	**" less D**	0.076	0.123
Portugal	2.08	5.58			
Spain	6.25	13.40			
Sweden	12.43	24.56	**EURO-11**	0.331	0.358
UK	7.66	14.13			
memo:USA	13.26	17.70	**" less D**	0.336	0.342

Source: US Bureau of Labor Statistics, Office of Technology and Productivity.

Table 6.
Nominal Manufacturing Wage Growth Correlations in National Currency and DM Terms

	Average Correlation Coefficient in Group					
	Annual Nominal Wage Growth in Manufacturing in Local Currency			**Annual Nominal Wage Growth in DM Basis**		
	Total Sample	1976-86	1987-96	Total Sample	1976-86	1987-96
Core Europe (B,NL,L,D,A)	0.68 (0.11)	0.64 (0.12)	0.42 (0.34)	0.44 (0.27)	0.44 (0.26)	0.39 (0.33)
Core Europe + F, DK, IT	0.66 (0.12)	0.59 (0.22)	0.22 (0.33)	0.29 (0.25)	0.25 (0.31)	0.24 (0.25)
Euro-11	0.68 (0.13)	0.56 (0.19)	0.34 (0.33)	0.30 (0.27)	0.28 (0.32)	0.28 (0.39)
Euro-11 + DK, S, UK	0.65 (0.13)	0.55 (0.19)	0.30 (0.35)	0.32 (0.27)	0.33 (0.30)	0.26 (0.40)

Source: US Bureau of Labor Statistics, authors calculations
First differences in log hourly nominal compensation costs for production workers in manufacturing. in local currency or in DM converted using annual average exchange rates.

Table 7.
Synchronization of Real Wage Growth in Europe and USA

	Average Correlation Coefficient in Group			**Smallest and Largest Moment Matrix Eigenvalues (1961-79) and (1980-96)**		
	Total Sample	1961-79	1980-96	1961-79	1980-96	Percentage change
Core Europe (B,NL,D,A)	0.60 (0.08)	0.69 (0.16)	0.24 (0.38)	0.0026895 0.1704915	0.0009041 0.0144438	-66.4% -91.5%
Core Europe + F, DK, IT	0.59 (0.13)	0.45 (0.24)	0.08 (0.41)	0.0017598 0.2910252	0.0002755 0.0184706	-84.3% -93.6%
Euro-11 lite*	0.55 (0.13)	0.36 (0.25)	0.06 (0.42)	0.0009964 0.4046713	0.0001937 0.0261281	-80.6% -93.5%
Euro-11 lite* + DK, S, UK	0.46 (0.20)	0.35 (0.24)	0.14 (0.39)	0.0005623 0.4545829	1.35×10^{-5} 0.0359264	-97.6% -92.1%
Memo: USA 8 regions, 1978-1992, real comp.)	0.59 (0.18)			6.68×10^{-5} 0.0162503		
US (8 Regions, 1978-1992 real wages and salaries)	0.55 (0.20)			6.10×10^{-5} 0.0157314		

Note: Real wage growth is measured as first difference in the logarithm of the nominal wage index reported by the IMF, International Finance Statistics, divided by the IMF/IFS consumer price index.
*less Luxemburg. Portugal

Table 8.
Manufacturing Real Wage Growth Correlations Using Different Price Indexes

	Average Correlation Coefficient in Group					
	Wages deflated by OECD Price Index			Wages deflated by IMF Price Index*		
	Total Sample	1976-86	1987-96	Total Sample	1976-86	1987-96
Core Europe (B,NL,L,D,A)	0.39 (0.25)	0.49 (0.23)	0.06 (0.49)	0.44 (0.26)	0.50 (0.23)	0.17 (0.59)
Core Europe + F, DK, IT	0.22 (0.26)	0.27 (0.30)	0.13 (0.38)	0.23 (0.43)	0.27 (0.27)	0.13 (0.43)
Euro-11	0.13 (0.25)	0.14 (0.30)	0.13 (0.36)	0.12 (0.25)	0.12 (0.29)	0.13 (0.38)
Euro-11 + DK, S, UK	0.14 (0.23)	0.17 (0.29)	0.13 (0.35)	0.14 (0.38)	0.16 (0.29)	0.14 (0.36)

*Luxembourg excluded.

References

Agell, Jonas (1998) "On the Benefits from Rigid Labour markets: Norms, Market Failures, and Social Insurance," Uppsala Dept of Economics Working Paper 1998:17.

Akerlof, George and J.L. Yellen (1985) "A Near-Rational Model of the Business Cycle, with Wage and Price Inertia," *Quarterly Journal of Economics* 100: 823-838

Ball, Lawrence and David Romer (1990) "Real Rigidities and the non-Neutrality of Money" *Review of Economics and Statistics* 57:183-203.

Barro, Robert and David Gordon (1983) "A Positive Theory of Monetary Policy in a Natural Rate Model," *Journal of Political Economy* 91:589-610.

Bayoumi, Tamim and Barry Eichengreen (1993) "Shocking Aspects of European Monetary Integration," in Torres, F and F. Givazzi, *Adjustment and Growth in the European Monetary Union* Cambridge, Cambridge University Press.

Bayoumi, Tamim and Barry Eichengreen (1996) "Operationalizing the Theory of Optimum Currency Areas," CEPR Discussion Paper No.1484, October.

Bean, Charles (1998) "The Interaction of Aggregate Demand Policies and Labor Market Reform," *Swedish Economic Policy Review*.

Belke, Ansgar (1996) "Implikationen einer zentralisierten Geld- und Währungspolitik für die Beschäftigung in Europa" Diskussionspaper Nr.8 Universität Bochum.

Berthold, Norbert and Reiner Fehn (1998) Does EMU Promote Labor-Market Reforms?" *Kyklos* 51: 509-536.

Bils, Mark (1985) "Real Wages and the Business Cycle: Evidence from Panel Data", *Journal of Political Economy* 93: 666-689.

Blanchard Olivier (1990) „Why does Money Affect Output: A Survey" Chapter 15 of Friedman, B. and F. Hahn, (eds.) *Handbook of Monetary Economics* Amsterdam: Elsevier.

Blanchard, Olivier, and Larry Katz (1992) "Regional Evolutions" *Brookings Papers on Economic Activity* 1:1992, 1-75.

Bofinger, Peter (1994) "Is Europe an Optimal Currency Area?" CEPR Discussion Paper No. 915.

Branson, William and Julio Rotemberg (1980), "International Adjustment with Wage Rigidity", *European Economic Review*, 13 (3): 750-777.

Bruno, Michael and Jeffrey Sachs (1985), *Economics of Worldwide Stagflation*, Cambridge Massachussets: Harvard University Press.

Buiter, Willem (1995) "Macroeconomic Policy during a Transition to Monetary Union," CEPR Discussion Paper No. 1222, August.

Burda, Michael (1995) "Unions and Wage Insurance" CEPR Discussion Paper No.1232, August.

Buti, Marco and André Sapir (1998) *Economic Policy in the EMU* Oxford: Oxford University Press.

Calmfors, Lars (1998a) "Macroeconomic Policy, Wage Setting and Employment – What Difference does EMU Make?" *Oxford Review of Economic Policy* 14:125-151.

Calmfors, Lars (1998b) "Unemployment, Labour-Market Reform and Monetary Union," Institute for International Economics Studies Seminar Paper 639, April.

Calmfors, Lars (1998c) "Monetary Union and Precautionary Labour-Market Reform" Institute for International Economics Studies Seminar Paper 659, November.

Carleton, Dennis (1986) "The Rigidity of Prices, " *American Economic Review*, 76, 637-658.

Cuikerman, Alex and Francesco Lippi (1998a) "Central Bank Independence, Centralization of Wage Bargaining, Inflation and Unemployment – Theory and Evidence," CEPR Discussion Paper 1847, March.

Cuikerman, Alex and Francesco Lippi (1999) "Labor Markets and Monetary Union: A preliminary Strategic Analysis," mimeo, March.

Danthine, Jean-Pierre and Jennifer Hunt (1994) "Wage Bargaining Structure, Employment and Economic Integration," *Economic Journal* 104: 528-541.

Décressin, Jörg and Antonio Fatas (1995) "Regional Labor Market Dynamics in Europe" *European Economic Review* 39:1627-1655.

DeGrauwe, Paul (1991) "Is Europe an Optimal Currency Area? Evidence from Regional Data," CEPR DP Number 555.

Dohse, Dirk and Christiane Krieger-Boden (1998) *Währungsunion und Arbeitsmarkt. Auftakt zu unabdingbaren Reformen* (Kieler Studien 290) Tübingen: Mohr Siebeck.

Dornbusch, Rudiger (1996) "The Effectiveness of Exchange Rate Changes," *Oxford Review of Economic Policy* 12:26-38.

Dornbusch, Rudiger, Carlo Favero, and Francesco Giavazzi (1998) Immediate Challenges for the European Central Bank," *Economic Policy* 26:15-64.

Duca, John (1998) "How Increased Product Market Competition May Be Reshaping America's Labor Markets," Federal Reserve Bank of Dallas *Economic Review* Fourth Quarter 1998, 2-16.

Eichengreen, Barry (1993) "European Monetary Unification" *Journal of Economic Literature* 31:1321-1357.

Eichengreen, Barry (1998) "European Monetary Union: a Tour d'Horizon" *Oxford Review of Economic Policy.*

Fatas, Antonio (1997) "EMU: Countries or Regions: Lessons from the EMS Experience," *European Economic Review* 41:743-751.

Feldstein, Martin "The Case against EMU" *The Economist* June 13, 1992, p. 19-22.

Frankel, Jeff and Andrew Rose (1996) "The Endogeneity of the Optimum Currency Area Criteria," CEPR Discussion Paper 1473, September.

Frankel, Jeff and Andrew Rose (1997) "Is EMU More Justifiable *ex post* than *ex ante*?" September. *European Economic Review* 41:753-760.

Friedman, M. (1953) "The Case for Flexible Exchange Rates" in *Essays in Positive Economics* Chicago, University of Chicago Press, 153-203.

Gros, Daniel and Carsten Hefeker (1998) "Factor Mobility, European Integration and Unemployment," mimeo, CEPS Brussels.

Hagen, Jürgen von, and Manfred J. M. Neumann (1994), "Real Exchange Rates Within and Between Currency Areas: How Far Away is EMU?" *Review of Economics and Statistics*, 2:236-244.

Hamermesh, Dan (1993) *Labor Demand* Princeton: Princeton University Press.

Hefeker, Carsten (1998) "Labor Market Rigidities, Unions and Monetary Union," mimeo, University of Basel.

Jeanne, Olivier (1998) "Generating Real Persistent Effects of Monetary Shocks: How Much Nominal Rigidity Do We Really Need?" *European Economic Review* 42:1009-1032.

Kenan, Peter (1969) "The Theory of Optimum Currency Areas: An Electic View" in R. Mundell and A. Swoboda, (eds.) *Problems of the International Economy* Chicago: University of Chicago Press.

_____ (1985) "Small Menu Cost and Large Business Cycles: A Macroeconomic Model of Monopoly," *Quarterly Journal of Economics* 100:529-539.

Knetter, Michael (1989) "Price Discrimination by US and German Exporters," *American Economic Review* 79: 198-210.

McKinnon, Ronald (1963) "Optimal Currency Areas" *American Economic Review* 53:715-25.

Mundell, Robert (1961) "The Theory of Optimal Currency Areas" *American Economic Review* 51:657-665.

OECD (1994) *The Job Study* Paris: OECD.

Romer, David (1996) *Advanced Macroeconomics* New York: McGraw Hill.

Sachs, Jeffrey (1979), "Wages, Profits and Macroeconomic Adjustment: A Comparative Study", *Brookings Papers on Economic Activity*, 2: 269-319.

Sachs, Jeffrey (1983), "Real Wages and Unemployment in the OECD Countries," *Brookings Papers on Economic Activity*, 1: 255-304.

Soskice, David and Torben Iversen (1999) "The Nonneutrality of Monetary Policy with Large Price or Wage Setters," *Quarterly Journal of Economics* forthcoming.

Streeck, Wolfgang (1998) "The Internationalization of Industrial Relations in Europe: Prospects and Problems," Working Paper Series in European Studies Number 1.

Taylor, John (1980) "Aggregate Dynamics and Staggered Contracts" *Journal of Political Economy* 88:1-24.

Wyplosz, Charles (1997) "EMU: Why and How it Might Happen," *Journal of Economic Perspectives* 4 (11):3-21.

APPENDIX

In Tables 2-9, I present some suggestive evidence in support my twin hypotheses of increasing nominal rigidities on the one hand and decreasing real rigidities on the other. The variables considered are 1) consumer prices, 2) nominal wages for the total economy 3) real wages, all from the IMF IFS and using a longer sample (1961-1996); data gathered by the US Bureau of Labor Statistics (http://stats/bls/gov/proghome.htm) on manufacturing wages and exchange rates; and the OECD price index (1976-1996). Correlations of first differences in logarithms of these variables were examined in different grouping: a core group (Germany, Luxemburg, Belgium, Holland, and Austria); the core plus France, Italy and Denmark; the Euro-11; and finally the Euro-11 adding back Denmark, plus Sweden and the UK. The average correlation coefficient provides a rought indicator of the co-movement, while eigenvalues of the moment matrix indicates the extent to which linear combinations of countries can replicate others; the number of zero eigenvalues later indicates the extent to which "insurance" is possible.